AIR POLLUTION: BUILDING ON THE SUCCESSES

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INTRODUCTION

In the Clean Air Act Amendments of 1970, Congress required the states to regulate air pollution according to federal specifications. The federal Environmental Protection Agency (EPA) would set national ambient air quality standards through an administrative process. Each state would then, through separate administrative processes, adopt a plan intended to compel emission sources within its borders to achieve emission reductions sufficient to meet EPA air quality standards by specified deadlines. The Supreme Court soon concluded that this two-step administrative process was the "heart" of the Clean Air Act.[1] With it, the Court opined in famously quotable words, Congress took "a stick to the States."[2] The federal stick was aimed at the states, not the polluters.

The evidence from thirty-eight years under this scheme shows that federal air pollution regulation achieved the greatest pollution reductions when the requirements were aimed directly at reducing emissions from pollution sources rather than at requiring states to comply with federal planning procedures. We propose that Congress stop regulating the states and focus on regulating the largest factories and other industrial sources. By directly regulating several thousand such sources, as well as continuing to regulate new vehicles directly, and certain other nationally-marketed goods (mainly fuels, paints, and solvents), the federal government would itself control the lion's share of *inter*state

* We thank Barbara Bankoff, Carol Casazza Herman, William F. Pedersen, and Richard B. Stewart for their thoughtful comments on earlier drafts as well as Wen Yan Schieffelin, Peter A. Schikler, both New York Law School Class of 2008, and Melissa A. Witte, New York Law School Class of 2009, for their diligent research assistance.

[1] Train v. NRDC, 421 U.S. 60, 66 (1975).

[2] *Id*. at 64.

pollution. Congress should leave the remaining sources—the overwhelming majority in terms of the numbers of facilities—to the states.

This approach builds on four federal efforts that achieved the biggest successes in reducing emissions. Each of these efforts involved direct Congressional action:

- Congress reduced urban smog from cars by directing that auto manufacturers cut emissions from new cars by 90 percent from 1970 levels.
- Congress removed the most ubiquitous source of atmospheric lead when it effectively mandated that motorists use lead-free gas in new cars because the leaded variety would ruin their emission control systems.
- Congress, in a 1990 amendment to the Clean Air Act aimed at reducing acid rain, required that power plants cut their emissions of sulfur dioxide by 50 percent from 1980 levels.
- Congress, also in 1990, acting to implement the Montreal Protocol, banned the production of most chemicals that harm stratospheric ozone.

These four provisions produced large reductions in air pollution. Today, average automobile emissions per mile are down at least 90 percent below mid-1960s levels.[3] The most recent models are near-zero-emission vehicles, with emissions more than 99 percent lower than those of cars built before the mid-1970s.[4] Gasoline no longer contains lead. Sulfur dioxide (SO_2) emissions from power plants are down 43 percent since 1990.[5] Production of most ozone depleting chemicals has ended.

All four of these parts of the Clean Air Act involved direct action. Congress made the two pivotal decisions—how much

[3] A. W. GERTLER, ET AL., EMISSIONS FROM DIESEL AND GASOLINE ENGINES MEASURED IN HIGHWAY TUNNELS (Health Effects Institute 2002); Gary A. Bishop & Donald H. Stedman, *A Decade of On-Road Emissions Measurements*, 42 ENVTL. SCI. & TECH. 1651, 1654–56 (2008), *available at* http://pubs.acs.org/cgi-bin/sample.cgi/esthag/asap/pdf/es702413b.pdf?isMac=195617.

[4] Bishop and Stedman, *supra* note 3; J. F. Collins, et al., *Measurements of In-Use Emissions from Modern Vehicles Using an On-Board Measurement System*, 41 ENVTL. SCI. & TECH. 6554 (2007); James Ehlmann & George Wolff, *Mobile Emissions: The Road Toward Zero*, ENVTL. MANAGER, Jan. 2005, at 33.

[5] According to EPA data, power plant SO_2 emissions dropped 43 percent from 1990–2007. U.S. ENVTL. PROT. AGENCY, CLEAN AIR MARKETS – DATA AND MAPS, http://camddataandmaps.epa.gov/gdm/index.cfm (last visited Sept. 30, 2008).

pollution should be cut, and by whom. EPA's role was to implement the restrictions as Congress directed.

Another common feature is that Congress gave the pollution sources flexibility on how to achieve the desired results. For example, with the acid rain program, Congress set an overall cap on emissions and to achieve it employed a cap-and-trade system that allowed sources to decide how to distribute the pollution reduction burden among themselves and how to achieve it. This flexible system gave sources a financial incentive to find new ways to cut emissions. Congress used a similar approach for lead in gasoline and ozone-depleting chemicals and allowed some flexibility for meeting the new-vehicle standards.

The parts of the Clean Air Act that were less effective in reducing emissions took a round-about approach that involved large doses of process and administration prior to, and along with, each increment of actual pollution reduction and allowed sources much less flexibility on how to reduce emissions. Chief among them were the provisions that took "a stick to the States."[6] Citing those provisions, Congress told voters in 1970, "all Americans in all parts of the country shall have clean air to breathe within the 1970s."[7] Yet, the nation missed this goal by decades. Pollution levels were drastically reduced, but how much of that reduction was due to the post-1970 federal planning process is unclear. States in the 1960s did more to cut two key stationary source pollutants—SO_2 and particulate matter—than was accomplished in the 1970s after EPA took charge.[8] Moreover, pollutants that were perceived to pose health risks—mainly particulates, SO_2, and (in Los Angeles) ozone—were declining for decades before 1970, without a discernible increase in the rate of improvement after the federal government took over.[9]

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[6] Train v. NRDC, 421 U.S. at 66.

[7] 116 CONG. REC. 42,381 (1970) (statement of Senator Muskie).

[8] Douglas Costle, EPA Administrator, Remarks at the Meeting of the Air Pollution Control Association in Montreal, Canada (June 23, 1980). He was speaking of reductions achieved from 1964–72, but acknowledged that those came from state actions in the 1960s. On state progress in the 1960s, see, e.g., Richard L. Revesz, *Federalism and Environmental Regulation: A Public Choice Analysis*, 115 HARV. L. REV. 553, 578–83 (2001).

[9] Indur M. Goklany, *Empirical Evidence Regarding the Role of Nationalization in Improving U.S. Air Quality*, *in* THE COMMON LAW AND THE ENVIRONMENT: RETHINKING THE STATUTORY BASIS FOR MODERN ENVIRONMENTAL LAW 27, 30 (R. Meiners & A. Morriss, eds. 2000).

From this thirty-eight-year-long experience we draw three lessons that inform our recommendations. First, the greatest and most rapid reductions in air pollution were accomplished when the federal government, by direct congressional act, set actual emission targets. When Congress instead left that decision to agency administrative processes, less pollution abatement occurred. Second, these emission cuts were often facilitated by methods that gave sources flexibility in how to reduce emissions and incentives to do so. Third, states proved at least as effective as the federal government in abating air pollution in situations where local impacts dominated.

To act on these lessons and to focus the Clean Air Act on results and away from process, we propose that:

1. **Congress should impose direct federal regulation on the largest industrial sources.** This regulation should, to the extent feasible, be modeled on the power-plant SO_2 program—that is, with a "cap-and-trade" program and with emission limits that are not dependent on whether a source is "existing" or "new."[10]

2. **Congress should continue direct federal regulation of emissions for new vehicles, fuels, and paints and solvents.** Among issues to be left to the states should be emission inspections of cars in use. This requirement should be eliminated as largely ineffective or, in the alternative, federal oversight should be replaced by a federal target directed at grossly emitting vehicles that states may achieve in any manner they wish**.**

Businesses should be given the maximum feasible latitude in

[10] We do not address the question of whether an emissions tax would be superior to cap-and-trade. Cap-and-trade would be an improvement over the present command-and-control approach to conventional pollutants and legislators do not seem to be seriously considering an emissions tax approach to these pollutants. When it comes to climate change, however, prominent authors have argued that a revenue-neutral emissions tax is a superior to a cap-and-trade approach. *See, e.g.*, WILLIAM NORDHAUS, A QUESTION OF BALANCE (Yale University Press 2008); KENNETH P. GREEN, STEVEN F. HAYWARD, AND KEVIN A. HASSETT, CLIMATE CHANGE: CAPS VS. TAXES (American Enterprise Institute 2007), *available at* http://www.aei.org/publications/filter.all,pubID.26286/pub_detail.asp. Others have disagreed. *See, e.g.*, RICHARD B. STEWART & JONATHAN B. WEINER, RECONSTRUCTING CLIMATE POLICY 66, 68–75 (AEI Press 2003) (discussing advantages of emissions trading over emissions taxes in domestic and international greenhouse gas regulation).

how to achieve the congressionally-set targets for federally regulated sources, and states should have some latitude to impose tougher requirements.

3. **Congress should restore to the states the choice of how to address the remaining sources.** The only exception should be a backstop provision for the unlikely event that the remaining sources cause an interstate pollution problem. Otherwise, the federal government's role would be limited to providing information to the states and the public on levels and trends in air pollution, its consequences, and the means of its control.

Our recommendations would put the focus on results, rather than process, and give the federal government the manageable job of regulating a few thousand pollution sources rather than hundreds of thousands of individual sources, but would nevertheless put under federal control the vast majority of *inter*state pollution.

Should the federal government choose to control greenhouse gases, whether through cap-and-trade or a carbon tax, such control could be melded into our division of authority, since we already place the largest sources of greenhouse gases—motor vehicles and fuels, power plants, and large industrial plants—under federal control. In contrast, the command-and-control approach to conventional air pollutants is antithetical to a cap-and-trade or carbon tax approach to greenhouse gases for many reasons, including that it takes away from sources the flexibility to adapt that is the primary virtue of cap-and-trade or a carbon tax approach.[11]

I. CONGRESS SHOULD IMPOSE DIRECT FEDERAL REGULATION ON THE LARGEST INDUSTRIAL SOURCES

After twenty years of experience, Congress, with the 1990 Clean Air Act Amendments, tried a new approach to stationary-source regulation when it created a "cap-and-trade" program for power plants. It placed a declining cap on total emissions of SO_2

[11] William F. Pedersen, *Adapting Environmental Law to Global Warming Controls*, 17 N.Y.U. ENVTL. L.J. 256 (2008); *see also* Lisa Margonelli, *Waste Not: A Steamy Solution to Global Warming*, THE ATLANTIC MONTHLY, May 2008, *available at* http://www.theatlantic.com/doc/200805/recycled-steam.

from these sources, put emission credits equal to the cap into the hands of power plants, and prohibited any plant from emitting in excess of the emissions credits it holds. Congress achieved flexibility by allowing sources to control their emissions in any verifiable way they chose and to have the additional option of trading emission credits among sources. Cap-and-trade was a radical departure from the traditional mode of regulation, sometimes dubbed "command-and-control," in which regulators assign an emission limit to each smokestack, vent, or other pollution source in each facility, and limit companies' flexibility in how to comply with the emission limits.

Cap-and-trade was radical in two ways. First, it focused on results—the desired pollution reductions—but did not tell companies by what means they must achieve these results. Second, it gave companies the opportunity to trade pollution credits. Having sources meet a performance standard, rather than install specific types of equipment, created competition among pollution abatement technologies and methods, thus reducing costs, stimulating innovation, and allowing sources to take advantage of changing marketplace conditions.[12] The ability to trade reduced costs further by allowing facilities with high pollution-reduction costs to buy credits from facilities with lower costs created even greater incentives for innovation by making every increment of pollution reduction a valuable commodity. Under the cap-and-trade program, the costs of reducing SO_2 from power plants dropped by more than half, saving the public billions.[13] The potential for these savings was key to Congress enacting the acid rain program in the first place.

The approach taken in the acid rain SO_2 program has many other advantages over traditional regulation. The first section of this part, which examines the traditional approach to interstate pollution and its shortcomings, will outline those advantages. The second section details our five recommendations, which in summary are that Congress: (1) extend the acid rain program from

[12] *See, e.g.*, Lorena Bark Malecha et al., *San Francisco Bay Area Boatyards: A Case Study in Regulating Small Polluters*, 20 B.C. ENVTL. AFF. L. REV. 453, 474–75 (1993) (pointing out that performance standards are believed to afford more flexibility than design standards, which is important for encouraging innovation and economically efficient regulation).

[13] Dallas Burtraw et al., *Economics of Pollution Trading for SO_2 and NO_x*, 30 ANN. REV. ENV'T & RES. 253, 264 (2005).

power plants to all categories of sources whose members are the biggest contributors to interstate pollution; (2) integrate all pollutant limits into a common framework, rather than regulate them piecemeal; (3) regulate through cap-and-trade (rather than command-and-control) all source categories for which it is possible to measure emissions, with the same emission limits for existing and new sources; (4) decide how to set emission caps and allocate emission credits; and (5) choose which sources to subject to direct federal regulation so as to address most *inter*state pollution while minimizing the total number of federally regulated stationary sources.

A. *The Present Program*

A key rationale for national air pollution legislation was that pollution crosses state boundaries. Congress inserted in the 1970 statute a requirement that EPA disapprove a state implementation plan (SIP) if the plan would inflict too much pollution on downwind states. EPA did not disapprove a SIP on the basis of interstate pollution until 1998—twenty-eight years after the statute's adoption.[14]

One reason for the failure was that the agency lacked the political muscle to allocate expensive burdens among contending states, each championed by its own congressional delegation. As a result, in a bizarre twist on the federal role, EPA policed *intra*state pollution, but not *inter*state pollution. Even more perversely, some states satisfied EPA's requirements on intrastate pollution by letting power plants build tall stacks that wafted the pollution to downwind states.[15] In other words, the Clean Air Act actually caused much of today's interstate pollution.

Since 1998, the agency has acted aggressively on interstate pollution, most notably with the NOx "SIP Call" and later with the Clean Air Interstate Rule. The task is, however, a difficult one for the agency, not only because of political obstacles, but also because EPA is imposing federal regulations under cover of the SIP process, which contemplates states acting individually to

[14] DAVID SCHOENBROD, SAVING OUR ENVIRONMENT FROM WASHINGTON: HOW CONGRESS GRABS POWER, SHIRKS RESPONSIBILITY, AND SHORTCHANGES THE PEOPLE 127 (Yale University Press 2005).

[15] Richard L. Revesz, *Federalism and Interstate Environmental Externalities*, 144 U. PA. L. REV. 2341, 2350–54 (1996).

reduce emissions within their borders. Indeed, the Court of Appeals for the D.C. Circuit recently vacated the Clean Air Interstate Rule on the basis that the agency's methodology did not track the statute's logic.[16] This suggests that the agency might well not be able to use a similar methodology for dealing with greenhouse gases. In any event, the decision is a setback for dealing with conventional pollutants. Indeed, a *New York Times* editorial, "A Major Setback for Clean Air," called for legislation to fix the problem, which our proposal would do.[17]

The federal government would do a better job discharging federal responsibilities if Congress specified the emission limits, rather than shifting this responsibility to EPA. That is what Congress did in 1990 when it added to the Clean Air Act the program to limit power plant emissions of SO_2. Congress wrote the emission limits on power plants directly into the statute, rather than requiring EPA to arbitrate between contending states. This program reduced some pollutants from power plants, but it does not apply to all pollutants that they send across state lines and does not apply to other sources. Significant interstate pollution remains and is left to the erratic and slow SIP planning process.

While cap-and-trade proved viable where it was applied,[18] provisions elsewhere in the Clean Air Act were hostile to this method. Some sections block market-like approaches by imposing an emission limit that may not be satisfied through trading; other sections do not forbid trading altogether but discourage it.[19]

Also, the Clean Air Act often has the practical effect of forcing sources to use particular pollution-control technologies. The statute tells the agency to set emission limits based on the emission levels that can be achieved by the best available technology. Thus, the statute calls for the agency to limit emissions, rather than specify the control technology, so that

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[16] N.C. v. EPA, 531 F.3d 896, 907–08, 917 (D.C. Cir. 2008).

[17] Editorial, *A Major Setback for Clean Air*, N.Y. TIMES, July 16, 2008, at A18. The editorial called for legislation or an administrative solution, but the latter seems unlikely.

[18] *See* 42 U.S.C. §§ 7651–7651(o) (acid rain program), 7671(f) (allowances and transfers for ozone depleting substances), 7545(k)(7), (m)(5), (o)(5) (reformulated fuels programs) (2000).

[19] *See* 42 U.S.C. §§ 7411, 7412, 7475(a)(4), 7503(a)(1)(B)(2) (2000); *see also* Howard K. Gruenspect & Robert N. Stavins, *New Source Review Under the Clean Air Act: Ripe for Reform*, 147 RESOURCES 19, 20 (2002), *available at* http://www.heartland.org/pdf/10291.pdf.

sources can find and use the most economical approaches for their situation. Nonetheless, companies often feel constrained to use the same technology that the regulators had in mind in order to avoid penalties in case a less expensive alternative fails to work as expected, or with which regulators are less familiar or comfortable.[20] A results-focused approach would allow a source stuck with a disappointing technology to avoid a penalty by finding additional ways to control its emissions, while the ability to trade would allow it to make up any remaining difference by buying extra emissions credits from other companies that were more successful at reducing their emissions.

Enforcement is easier under cap-and-trade programs because it is focused on relatively straightforward determinations of actual emissions and credits held, rather than on a laundry list of process and paper-work requirements that may be difficult to understand, comply with, and monitor and that doesn't necessarily have a direct relationship to actual emissions. In addition, under cap-and-trade a source can readily avoid becoming a violator by buying credits—essentially paying another source to pollute less. For that reason, violations under the acid rain program are subject to automatic penalties and violations have been rare. In contrast, violations are much more common under command-and-control, and enforcement entails difficult questions about what the source could have done to avoid it.

There are additional perverse effects of traditional regulation under the Clean Air Act. The Clean Air Act authorizes EPA and the states to set different standards for different subcategories of sources and even different individual sources. As a result, companies or industries that use inherently high-emitting or difficult-to-control technologies or processes can receive less stringent emission limits than other facilities or industries.[21] This encourages the use of dirtier technologies.

There is still another powerful reason to move from process-focused to results-focused regulation and to include pollution trading in any reformed system of air pollution control. It makes it feasible to put old plants on the same footing as new ones. The

[20] *See* COMM. ON AIR QUALITY MGMT. IN THE U.S., NAT'L RESEARCH COUNCIL, AIR QUALITY MANAGEMENT IN THE UNITED STATES 174, 187 (2004) [hereinafter AIR QUALITY MANAGEMENT].

[21] Byron Swift, Envtl. Law Inst., *How Environmental Laws Work*, 14 TUL. ENVTL. L.J. 309, 379–81, 409 (2001).

Clean Air Act now imposes tougher emission limits on new and modified sources. This encourages sources to keep old plants operating far beyond their ordinary economic life and many of them are left little-controlled, if at all.[22] Prolonging the lives of inefficient, inherently dirty old plants through perverse regulatory policies is bad for the environment and for the economy. The new versus old distinction also creates a barrier to entry for new firms, reducing competition and slowing innovation. The result is not only slower progress in reducing air pollution, but also higher prices and lower quality for consumer goods.[23] EPA has attempted to skirt this flaw in the Clean Air Act by widening the definition of what constitutes a "modification" that triggers the requirement for existing sources to meet the stricter standards applicable to new sources. But this backdoor way of dealing with the problem introduces uncertainty and encourages companies to shape their capital expenditures to avoid a "modification," despite adverse consequences for productivity and pollution control.

The most fundamental reason for reform is that the National Ambient Air Quality Standard-State Implementation Plan (NAAQS-SIP) process is neither credible nor effective because it emphasizes creating and demonstrating compliance with procedural requirements that are supposed to lead to pollution reductions rather than actually reducing air pollution itself.[24] A National Research Council study described this concern in unusually strong language:

> The SIP process now mandates extensive amounts of local, state, and federal agency time and resources in a legalistic, and often frustrating proposal and review process, which focuses primarily on compliance with intermediate process steps. The process probably discourages innovation and experimentation at the state and local levels; overtaxes the limited financial and human resources available to the nation's [Air Quality Management] system at state, local, and federal levels; and draws attention and resources away from the more germane issue of ensuring progress towards the goal of meeting the

[22] AIR QUALITY MANAGEMENT, *supra* note 20, at 188 ("older plants have not had to make emissions reductions in many cases"); *see also id.* at 294.

[23] Jonathan R. Nash & Richard L. Revesz, *Grandfathering and Environmental Regulation: The Law and Economics of New Source Review*, 101 NW. U. L. REV. 1677, 1720–21, 1729 (2007).

[24] R. Shep Melnick, *Pollution Deadlines and the Coalition for Failure*, *in* THE PUBLIC INTEREST 123, 126 (Michael S. Greve & Fred L. Smith, eds. 1984).

NAAQS.[25]

The cumbersomeness of the NAAQS-SIP process has deterred EPA from applying it to pollutants beyond the six pollutants already covered in 1971, despite the statutory requirement that the agency apply it to *all* air pollutants that EPA comes to judge to be harmful and that come from many sources. EPA later included lead, but that was because of a court order in a case brought by environmental attorneys, including a co-author of this essay.[26] Under the letter of the Clean Air Act, EPA should have included dozens of other air pollutants, but understandably declined to do so.[27] EPA's failure to apply the NAAQS-SIP process to new pollutants is powerful evidence that it no longer makes sense for pollutants to which it has long applied.

Finally, because of the Clean Air Act's structure and the inherent complexity of developing and setting standards for a multiplicity of pollutants and types of sources all at the same time, sources learn of their obligations piecemeal, increasing the cost and difficulty of compliance. For example, the NAAQS for various pollutants are revised at separate times with separate planning and enforcement deadlines. As a result, states tend to revise their implementation plans pollutant by pollutant.[28] The piecemeal announcement of obligations is a problem because sources typically emit many kinds of pollutants and many

[25] AIR QUALITY MANAGEMENT, *supra* note 20, at 128.

[26] NRDC v. Train, 545 F.2d 320 (2d Cir. 1976). Professor Schoenbrod served as counsel for NRDC.

[27] In implementing the Clean Air Act, EPA has, to a degree, emphasized parts of the Act that have done the most to cut emissions and de-emphasized others. It has adopted requirements for large trucks and other heavy-duty vehicles that emulate those that were reducing pollution from cars and other light-duty vehicles and additional programs for power-plant emissions that emulate the 1990 Clean Air Act requirements to reduce sulfur dioxide. *See* Finding of Significant Contribution and Rulemaking for Certain States in the Ozone Transport Assessment Group Region for Purposes of Reducing Regional Transport of Ozone, 63 FED. REG. 57,356 (Oct. 27, 1998), [hereinafter NOx SIP Call]; Rule to Reduce Interstate Transport of Fine Particulate Matter and Ozone (Clean Air Interstate Rule); Revisions to Acid Rain Program; Revisions to the NOx SIP Call, 70 FED. REG. 25,162 (May 12, 2005) [hereinafter CAIR].

[28] In addition, as the National Research Council (NRC) notes, "Although the technology-specific control programs have considered a range of pollutants from the start, consideration has been segmented by the programs, such as NSPS, MACT, RACT, NSR, and PSD, at federal and state levels operating on different time frames and under different levels of stringency." AIR QUALITY MANAGEMENT, *supra* note 20, at 188.

pollutants are controlled by the same methods. Compliance could be more economical and straightforward if industries learn of their regulatory obligations all at once.[29]

B. *Recommendations*

1. *Congress Should Extend the Acid Rain Program from Power Plants to All Categories of Sources Whose Members Are the Biggest Contributors to Interstate Pollution*

Congress should take the basic principle of the acid rain program—direct federal regulation of an important *inter*state stationary source category—and extend it to include other categories of sources that contribute significantly to interstate pollution.

One way to do this is for Congress to institute direct federal regulation of point sources that belong to the following twelve stationary source categories: electric services, "electric and other services combined,"[30] petroleum refiners, paper mills, hydraulic cement mills, pulp mills, organic chemical plants, primary aluminum plants, carbon black plants, blast furnaces, lead smelters and raw sugar mills. The allocation of sources as between federal and state control is discussed below in recommendation 5.

2. *Congress Should Integrate All Pollutant Limits into a Common Framework, Rather than Regulate Them Piecemeal*

In regulating a source category, the new federal program should, to the extent feasible, announce all at once the emission limits applicable to all regulated pollutants emitted by that category. The emission limits will need periodic revision, but Congress should make every effort to cluster the changes. We do not underestimate the difficulty of this task, but suggest that

[29] "The result has been to make it difficult for any one facility to implement multi pollutant controls in a systematic and cost-effective fashion." *Id.*

[30] "Electric and Other Services Combined" (SIC – 4931) consists of industries primarily providing electricity, but also furnishing other utilities. U.S. DEP'T OF LABOR, STANDARD INDUSTRIAL CLASSIFICATION 4931: ELECTRIC AND OTHER SERVICES COMBINED, http://www.osha.gov/pls/imis/sic_manual.display?id=950&tab=description (last visited Sept. 30, 2008). Industries in which electricity sales account for 85 percent or more of revenues are listed as "Electric Services." U.S. DEP'T OF LABOR, STANDARD INDUSTRIAL CLASSIFICATION 4911: ELECTRIC SERVICES, http://www.osha.gov/pls/imis/sic_manual.display?id=945&tab=description (last visited Sept. 30, 2008).

success is more likely when evaluating all pollutants associated with a single industry rather than all industries that might emit a single pollutant, as the NAAQS-SIP process attempts to do.

3. *Congress Should Regulate Through Cap-and-Trade, Rather than Command-and-Control, with the Same Emission Limits for Existing and New Sources*

Cap-and-trade should be employed within and between all federally-regulated source categories for which it is possible to measure emissions. The acid rain program uses continuous emissions monitors for the fossil-fuel power plants to which it applies, but such monitors are not presently available for many other categories. EPA, as the National Research Council has recommended, should develop monitoring methods for additional categories.[31] In situations where direct monitoring is not feasible, emissions might still be reliably estimated through surrogate measures. This, too, should be a priority for EPA. Congress should give this work, and the resources to do it, to EPA staff who have run the acid rain program because this group has an institutional commitment to, and comfort and experience with, results-focused regulation.[32]

Congress should also provide that sources that exceed their emission cap under trading programs should be subject to an automatic fine. In addition, Congress should, as with the acid rain program, provide for banking of credits over time in order to encourage early reductions, while at the same time giving firms the opportunity to create a cushion against volatility in credit costs and to smooth out lumpiness in the development of new emission-reduction options.[33]

Congress should structure the cap-and-trade program to remove the incentive to keep old plants in service beyond their economic lives in order to avoid the tougher limits on new sources. As the acid rain program illustrates, cap-and-trade provides a way around this problem. It can mollify existing sources by giving them emission credits, but requires *all* sources—new or existing—

[31] AIR QUALITY MANAGEMENT, *supra* note 20, at 194–95.

[32] Robert N. Stavins, *Lessons from the American Experiment with Market-Based Environmental Policies, in* HARNESSING THE HURRICANE: THE CHALLENGE OF MARKET-BASED GOVERNANCE (John Donahue & Joseph Nye eds., 2002), at 11.

[33] AIR QUALITY MANAGEMENT, *supra* note 20, at 207.

to hold sufficient credits to cover their emissions. The owner of an existing source can realize the value of those credits without keeping that source operating beyond its economic life by selling the credits to another source, including a new source. The statute should over time phase down to zero the credits given to existing sources, so that their owners do not keep them going beyond their economic life merely to maintain a continued claim on valuable emission credits. Where cap-and-trade is not feasible and Congress feels impelled to give existing sources transitional relief, the statute should phase out the transitional relief in the shortest possible time.

With cap-and-trade, government controls how much pollution is emitted, but not where. However, impacts can be a function of where pollutants are emitted, and a concentration of emissions might produce a "hot spot." Such hot spots are, according to a report by the National Research Council, possible in theory but unlikely in practice and have not occurred in previous cap-and-trade programs.[34] After all, an overall reduction in emissions tends to reduce pollution everywhere. In addition, a recent analysis of cap-and-trade programs concluded that facilities that started out with the highest emissions tended to achieve the largest emission reductions.[35] Thus, to the extent any hot spots existed, cap-and-trade tended to "cool" them. This is exactly what economic theory would predict, since the largest emitters also tend to have the smallest marginal costs for pollution control. Ambient monitoring

[34] *Id.* at 196, 205, 206 ("Some analysts of cap and trade point out that there is little possibility that any given area will have negative impacts from the program, provided the cap is set low enough to reduce emissions by a large percentage"; "Even more significant, regions with the highest emissions such as the north-central region, have had the largest reductions."); *see also* Dallas Burtraw & Erin Mansur, *The Environmental Effects of SO_2 Trading and Banking*, 33 ENVTL SCI. & TECH. 3489, 3489, 3490 (1999) ("geographic consequences are not consistent with the fears of the program's critics"; "The Environmental Protection Agency finds that most allowances surrendered for compliance in 1995 and 1996 were used in the same state as they were allocated, leading the authors to conclude that little geographic shifting of emissions due to trading has occurred."). The power plants subject to the SO_2 trading program were also subject to SIPs to implement the NAAQS for SO_2, but this federal mandate did not have a practical effect because ambient SO_2 levels were already well below the NAAQS for most of the country.

[35] Byron Swift, *Emissions Trading and Hot Spots: A Review of the Major Programs*, 35 ENV'T REPORTER 1020, 1020 (2004) ("all trading programs examined have led to proportionately greater emissions reductions from the larger sources").

data also show that trading has not produced hot spots. Since the beginning of the acid rain cap-and-trade program, ambient levels of sulfate, the main type of particulate matter from coal-fired power plants, have declined everywhere in the U.S., with the largest declines occurring in areas that began with the highest sulfate levels.[36]

Moreover, states would retain the power to ward off hot spots by imposing tougher emissions limits on federally regulated sources. Furthermore, in the unlikely event that hot spots arise from trading among federally controlled sources, the federal government can limit trading to specific zones.[37] In sum, as a National Research Council study concluded, there are ways "to guard against even the possibility" of hot spots where they are a concern.[38]

Thus, we conclude that concern over hot spots is no reason to reject cap-and-trade in general. Should, however, a convincing case be made that particular pollutants are likely to increase, or at least not decline sufficiently, in some areas under cap-and-trade, Congress retains the authority to limit trading of such pollutants. For example, Congress could limit the total amount of emission credits traded into a given region of the country. Congress could even exclude a given pollutant from the trading program altogether and instead place separate not-to-exceed caps on each facility's emissions. Even if it excludes a pollutant from cap-and-trade, Congress should still focus on results rather than process by limiting its role to setting the caps and allowing sources to comply by whatever techniques they wish, so long as the reductions are verifiable.

Congress could also provide for regional differentiation in cases where there is a desire for particularly low pollution levels in special regions, such as in the case of maximizing visibility in national parks. This would be straightforward under our proposal because the sources that emit most of the pollutants that affect visibility would already be federally regulated. Ammonium sulfate is by far the most important pollutant affecting visibility in national parks. For example, in the three parks with the greatest

[36] U.S. ENVTL. PROT. AGENCY, CLEAN AIR STATUS AND TRENDS NETWORK (CASTNET) (2008), http://www.epa.gov/castnet/ (last visited Sept. 21, 2008).

[37] AIR QUALITY MANAGEMENT, *supra* note 20, at 206–07.

[38] *Id.* at 206.

visibility impairment—Great Smoky Mountains, Shenandoah, and Acadia—ammonium sulfate accounts for more than 80 percent of visibility impairment on days with the worst visibility and about 60 percent of visibility impairment on days with the best visibility.[39] SO_2 emissions are the source of sulfate haze, and the vast majority of SO_2 emissions come from sources under federal regulation in our plan. Volatile organic compounds and nitrogen oxides are also a factor in visibility in some parks, and our plan also puts the vast majority of these pollutants under federal control.

4. *Congress Should Decide How to Set Emission Caps and Allocate Emission Credits*

Congress should begin by deciding how much to cut various pollutants in a given period of time. It has made this kind of decision under the existing statute in setting deadlines for achieving NAAQS in areas that have failed to attain them. Under the existing statute, however, Congress put the responsibility for achieving the pollution reduction target on the states and EPA. In contrast, under our proposal, Congress itself would need to take responsibility for the critical policy choices—how to allocate the pollution reduction burden between industries and within industries.

Congress could allocate emission credits between and within industries by starting with current emissions and ratcheting them down. Alternatively, it could, as was done with the acid rain program, start with estimates of the emissions that would come from reasonably well controlled sources.

In making these decisions, Congress could itself allocate the emission credits as it did in the acid rain program. Alternatively, Congress could guide EPA by providing a benchmark as it did with new cars in 1970 (reduce emissions 90 percent) or with one aspect of the hazardous air pollutant program in 1990 ("the average emission limitation achieved by the best performing 12 percent of existing sources"). If, however, Congress has EPA allocate the emission credits, Congress must give the agency a realistic metric for decision, because when Congress delegates critical, politically-charged decisions, the result has typically been years of delay. Finally, Congress could combine agency

[39] John G. Watson, *Visibility Science and Regulation*, 52 J. AIR & WASTE MGMT. ASS'N 628, 660 (2002).

deliberation with legislative responsibility by tasking EPA to propose allocations which Congress would then vote up or down on an expedited process.

5. *Congress Should Choose Which Sources Should Be Subject to Direct Federal Regulation so as to Maximize the Coverage of Interstate Pollution and Minimize the Number of Federally Regulated Sources*

Congress should allocate sources between federal and state control to maximize the coverage of interstate pollution and minimize the number of federally regulated sources. We want to minimize the number of federally controlled sources to reduce the administrative difficulties for the federal government and also because, in our view, the federal government should generally let states and localities decide how to deal with intrastate pollution. A downside of holding down the number of federally-controlled sources is that this reduces opportunities for savings through trading. Nonetheless, our proposal not only widens opportunities for trading far, far beyond that permitted under current law, but includes most emissions within the federal regime. Beyond that, we would allow federally-regulated sources to sell emission credits to state regulated sources.

We have suggested for the sake of discussion that Congress provide for direct federal regulation of "point sources" that belong to twelve specific stationary source categories out of the 874 categories included in EPA's "AirData" for 1999.[40] These twelve categories include 3,225 point sources out of 52,194 point sources listed overall. In sum, we recommend federal regulation of only about 6 percent of all "point sources."

EPA's data includes, in addition to "point sources," two other groups of sources: "mobile sources" and "area sources."[41] Area sources in EPA's data include, to name some examples, many smaller industrial sources, commercial establishments such as dry cleaners, restaurants, buildings and houses, farms, construction sites (due to dust kicked up during construction) and forest fires.[42]

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[40] U.S. ENVTL. PROT. AGENCY, AIRDATA: ACCESS TO AIR POLLUTION DATA (2007), http://www.epa.gov/air/data/index.html (last visited on Feb. 25, 2008) (the 1999 data is the most recent available).

[41] EPA lumps mobile sources in with area sources in AirData but otherwise classifies them separately. Our discussion treats them as separate.

[42] In other words, in EPA's classification system "area" sources include not

There are literally millions of these area sources and hundreds of thousands are now supposed to be regulated under the federal system. EPA does not provide exact numbers.

Other than a few nationally distributed consumer products discussed in part II—vehicles, fuels, paints, and solvents—we would leave area sources from all source categories under state regulation as well as 94 percent of all point sources. Nonetheless, the sources we would put under federal control represent the vast majority of all interstate pollution.

- Sulfur dioxide. According to EPA estimates, our federally regulated sources account for 91 percent of emissions from point sources and 85 percent of total emissions. These sources would cover an even larger percentage of interstate pollution because much of the emissions not subject to federal control come from smaller sources, which tend to have shorter exhaust stacks so that their emissions are less likely to travel long distances.
- Nitrogen Oxides. According to EPA estimates, our federally regulated sources account for 78 percent of the emissions from point sources and 84 percent of total emissions. Once again, these sources would cover an even larger percentage of interstate pollution because much of the emissions not subject to federal control come from smaller sources, which tend to have shorter exhaust stacks. Moreover, some of the emissions not subject to federal control come from sources impossible to control, such as forest fires, or that have not been controlled except in limited areas, such as domestic hot water heaters.
- Volatile Organic Compounds (VOC). According to EPA estimates, our federally regulated sources account for about 58 percent of total VOC emissions. However, EPA's estimate is erroneous because it puts mobile-source emissions at less than 40 percent of total VOC emissions, while field studies show that the true value is probably somewhere around two-thirds on average, and as high as 75–80 percent in some areas, including California, Phoenix,

only true "area" sources—i.e., those sources that emit pollutants in a diffuse way, as in the case of forest fires or dust from construction—but also smaller "point" sources that emit pollution from an identifiable exhaust stack but whose mass of emissions are low enough to fall below EPA's threshold for considering it a "major" source.

the northeast, Atlanta, and Baltimore.[43] As a result, our federally regulated sources actually account for more than three-quarters of total VOC emissions. Of the remainder, no single source category contributes a large fraction. Residential wood combustion (fireplaces and wood stoves) and gasoline service stations contribute a few percent each. Fires (forest fires, agricultural burning, building fires) also account for a few percent. A wide range of industrial, commercial, and agricultural operations each make small contributions to the remainder.

- Particulate Matter (PM). According to EPA estimates, our federally regulated sources account for 64 percent of PM_{10} emissions from point sources and 7 percent of total PM_{10} emissions. According to the same estimates, our federally regulated sources cover 67 percent of $PM_{2.5}$ emissions from point sources and 19 percent of total $PM_{2.5}$ emissions. However, these emissions estimates are not particularly helpful in assessing the extent to which our federally regulated sources contribute to PM levels in the ambient air. First, a substantial portion of PM, especially the finer fractions embodied in $PM_{2.5}$, is "secondary" PM—that is, PM formed in the atmosphere from gaseous emissions of NOx, SO_2, and VOC, some of which are converted into, respectively, nitrate, sulfate, and organic PM. Nitrate and sulfate (in the form of ammonium nitrate and ammonium sulfate) account for half to two-thirds of all $PM_{2.5}$ in the

[43] Y. J. Choi and S. H. Ehrman, *Investigation of Sources of Volatile Organic Carbon in the Baltimore Area Using Highly Time-Resolved Measurements*, 38 ATMOSPHERIC ENV'T 775, 781 tbl.2 (2004) (motor vehicle contribution to anthropogenic (i.e., human-caused) non-methane organic carbon (NMOC) averaged 72 percent, or 64 percent when natural NMOC emissions were included); Eric M. Fujita et al., *Diurnal and Weekday Variations in the Source Contributions of Ozone Precursors in California's South Coast Air Basin*, 53 J. AIR & WASTE MGMT. ASS'N 844, 844, 862 (2003) ("contributions to ambient NMHC [non-methane hydrocarbons] by motor vehicle exhaust and evaporative emissions . . . ranged from 65 to 85%"). John Watson reviews eleven studies on data collected from 1984 to 1996 in various metropolitan areas around the U.S., finding that most studies, especially those based on data collected from 1990 onward, suggest mobile sources contribute 50–80 percent of anthropogenic VOC. A note on terminology: NMOC is essentially the same as VOC because VOC is understood to exclude relatively unreactive organic gases (such as methane) that are de minimis contributors to ozone formation. John G. Watson et al., *Review of Volatile Organic Compound Source Apportionment by Chemical Mass Balance*, 35 ATMOSPHERIC ENV'T 1567, 1574, 1580 (2001).

U.S.,[44] and our federal sources account for about 85 percent of all NO_x and SO_2 emissions. Most of the remaining $PM_{2.5}$ consists of carbonaceous material, both secondary organics formed from VOC, and directly emitted particles such as diesel soot and smoke from fireplaces and woodstoves. In other words, our federally regulated sources account for the vast majority of $PM_{2.5}$ in the air, especially the $PM_{2.5}$ that travels across state boundaries. Second, much directly emitted PM comes from agriculture, construction, and other activity that kicks up dust, as well as windblown dust. Most of this dust falls back to earth quickly, and therefore contributes little to PM levels in the ambient air. These PM sources are not significant contributors to interstate or, in most cases, even to regional pollution.[45] Overall, the sources we would put under federal control account for more than three quarters of total PM and for nearly all interstate PM. A few significant sources of PM emissions affect only local PM levels near where they are emitted and would be under state and local control. These include, for example, wood-smoke emissions from fireplaces and woodstoves and dust from construction operations.

- Carbon monoxide. According to EPA estimates, our federally regulated sources account for two-thirds of emissions from point sources and 83 percent of total emissions. Most of the remainder is from fires.
- Lead.[46] Until the late-1980s, the chief source of airborne lead was fuel additives. Today, lead emissions are 99

[44] U.S. ENVTL. PROT. AGENCY, LATEST FINDINGS ON NATIONAL AIR QUALITY, 2002 STATUS AND TRENDS (2003), *available at* http://www.epa.gov/air/airtrends/aqtrnd02/2002_airtrends_final.pdf

[45] EPA's PM emissions inventories are a poor guide for the actual sources of PM in the air because of a combination of inaccuracy in the emissions numbers, and the fact that much of the presumed emissions fall back to the ground before traveling far enough to become mixed in with the general ambient air. *See, e.g.*, JOHN G. WATSON & JUDITH C. CHOW, RECONCILING URBAN FUGITIVE DUST EMISSIONS INVENTORY AND AMBIENT SOURCE CONTRIBUTION ESTIMATES: SUMMARY OF CURRENT KNOWLEDGE AND NEEDED RESEARCH 5-2 to 5-4 (Desert Research Institute 2000), *available at* http://www.epa.gov/ttn/chief/efdocs/fugitivedust.pdf; RICHARD COUNTESS ET AL., METHODOLOGY FOR ESTIMATING FUGITIVE WINDBLOWN AND MECHANICALLY RESUSPENDED ROAD DUST EMISSIONS APPLICABLE FOR REGIONAL SCALE AIR QUALITY MODELING (2001), *available at* http://www.epa.gov/ttn/chief/conference/ei10/fugdust/countess.pdf.

[46] EPA's AirData does not provide emissions data for lead.

percent below their 1960s peak. The small amount of remaining emissions comes mainly from lead added to aviation gasoline (used only in airplanes with internal combustion engines but not in jets), with smaller contributions from lead smelters, waste incineration, and several other industries.[47] Fuels and lead smelters would remain under federal regulation in our proposal, resulting in nearly two-thirds of total lead emissions being under federal control.

- Hazardous air pollutants (HAPs). A number of factors make it difficult to put firm numbers on the fraction of HAPs that our federally regulated sources account for. However, it is clear that our proposal would put the vast majority of estimated HAP risks under federal control. First, diesel exhaust is the overwhelming source of HAP-related risks and nearly all diesel emissions would be under federal control in our proposal. Indeed, EPA recently reduced by 90 percent the allowable exhaust emissions from heavy-duty diesel vehicles.[48] According to the California Air Resources Board, diesel exhaust, which EPA does not include in its estimates of HAP emissions or risks, accounts for the vast majority of air pollution cancer risk in metropolitan areas—84 percent in a recent study in Los Angeles.[49] Of the remainder, benzene accounts for about 4.5 percent and 1,3-butadiene 3.3 percent, with other compounds accounting for the remaining 8.6 percent of air pollution-related cancer risk.

  Although EPA does not estimate cancer risks from diesel exhaust, it does estimate risks for many other HAPS. In

[47] U.S. ENVTL. PROT. AGENCY, REGULATORY IMPACT ANALYSIS OF THE PROPOSED REVISIONS TO THE NATIONAL AMBIENT AIR QUALITY STANDARDS FOR LEAD (2008); U.S. ENVTL. PROT. AGENCY, REVIEW OF THE NATIONAL AMBIENT AIR QUALITY STANDARDS FOR LEAD: POLICY ASSESSMENT OF SCIENTIFIC AND TECHNICAL INFORMATION (2007).

[48] U.S. ENVTL. PROT. AGENCY, REGULATORY ANNOUNCEMENT: HEAVY-DUTY ENGINE AND VEHICLE STANDARDS AND HIGHWAY DIESEL FUEL SULFUR CONTROL REQUIREMENTS (2000), *available at* http://www.epa.gov/oms/highway-diesel/regs/f00057.pdf.

[49] SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT, MULTIPLE AIR TOXICS EXPOSURE STUDY III (MATES-III), DRAFT REPORT 2-10 (2008), *available at* http://www.aqmd.gov/prdas/matesIII/draft/cover.pdf ("On average, diesel particulate contributes about 84% of the total air toxics risk.").

EPA's 1999 National Air Toxics Analysis, which assesses a total of 177 chemicals, benzene alone contributes one-quarter of total estimated national cancer risk from HAPs (excluding diesel) and 1,3-butadiene contributes 10 percent.[50] Mobile sources contribute an estimated 68 percent and 58 percent of total emissions of these pollutants, while major stationary sources contribute a few percent.[51]

Because diesel exhaust is by far the most important HAP, and other mobile source emissions account for most of the risk from non-diesel HAP emissions, our plan inherently puts the vast majority of HAP concerns under federal control. In addition, under our plan the largest industrial HAPs sources—chemical plants, refineries, pulp mills, power plants, and several others—would also be under federal aegis.

In any event, HAPs are essentially a local pollution issue rather than an interstate one because they dilute significantly over short distances, as shown by some mobile source examples. Direct measurements of black carbon (a diesel signature), carbon monoxide (a gasoline automobile signature), and ultrafine particles (both diesel and gasoline) near major freeways in Los Angeles show that these traffic-related pollutants are elevated by a factor of six to twenty on the freeway, but about 90 percent of this freeway spike is gone within three hundred feet of the freeway and levels are down to the regional background again by one thousand feet from the freeway.[52] According to the California Air Resources Board, levels of diesel pollutants from the ports of Los Angeles and Long Beach drop more than 95 percent within about ten miles inland from the ports.[53]

The preceding discussion has shown that the federal

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[50] U.S. ENVTL. PROT. AGENCY, 1999 NATIONAL-SCALE AIR TOXICS ASSESSMENT (2008), http://www.epa.gov/ttn/atw/nata1999/nsata99.html (last visited Sept. 15, 2008).

[51] *Id.*

[52] *See* Yifang Zhu et al., *Concentration and Size Distribution of Ultrafine Particles near a Major Highway*, 52 J. AIR & WASTE MGMT. ASS'N 1032 (2002).

[53] CALIFORNIA AIR RESOURCES BOARD, DIESEL PARTICULATE MATTER EXPOSURE ASSESSMENT FOR THE PORTS OF LOS ANGELES AND LONG BEACH (2006), *available at* http://www.arb.ca.gov/regact/marine2005/portstudy0406.pdf.

government could address the lion's share of interstate pollution concerns from criteria pollutants and HAPS, and, at the same time, leave all but a tiny fraction of sources to state control. It should be possible to come up with a still better way of minimizing the number of sources subject to federal control and maximizing federal control of interstate pollution, because EPA's source-by-source emission data are messy. A small staff with access to the raw data would likely need no more than a few months to come up with the necessary information for refining the allocation of state and federal responsibilities.

II. CONGRESS SHOULD CONTINUE DIRECT FEDERAL REGULATION OF EMISSIONS FROM NEW VEHICLES, FUELS, AND A FEW OTHER NATIONALLY MARKETED GOODS, BUT GIVE MAXIMUM FEASIBLE LATITUDE TO MANUFACTURERS IN HOW TO ACHIEVE CONGRESSIONALLY-SET TARGETS AND GIVE STATES SOME LATITUDE TO IMPOSE TOUGHER REQUIREMENTS

A. *New Vehicles and Fuels*

California began regulating new motor vehicle emissions during the 1960s, and other states threatened to follow suit. The federal government got involved only after auto manufacturers asked Congress to preempt the states and put a federal agency in charge. After the first Earth Day, Congress stepped in and imposed a 90 percent reduction requirement in 1970, while allowing California to impose tougher limits. It eventually gave other states the option of choosing either the California or the federal requirements. California used this latitude to continue to tighten its regulation and thereby repeatedly drove the federal government to tighten national regulations. Today, with California, followed by other states, beginning to regulate greenhouse gases in advance of the federal government, some manufacturers want the federal government again to preempt the states. The manufacturers argue that disparate state regulations would be disruptive.

Federal regulation of new vehicles and fuels should continue with the states given some latitude to adopt more stringent requirements. That means, at the minimum, the "two car" approach by which California can impose tougher requirements,

and other states choose between the federal and the California requirements. In addition, Congress should bring vehicle manufacturers within the system of tradeable emission credits, thus allowing trading within and between manufacturers' fleets. Moreover, Congress should allow trading between vehicle manufacturers and stationary sources.

We do not go into further detail because the essay in this issue by Andrew Morriss addresses new vehicles and fuels.[54] In it, he discusses ways to give individual states further latitude without placing unreasonable burdens on automakers and refiners.

B. *Vehicles in Use—Inspection and Maintenance*

The inspection and maintenance (I/M) requirement is intended to ensure that motorists keep their cars' emissions low by identifying and requiring repair of high emitters. These programs have performed poorly in practice. A 2004 National Research Council study found that "the nation's [air quality management] system has not come up with an effective and politically acceptable means to address" the problem of high-emitting vehicles.[55] We propose that Congress either eliminate the requirement that states inspect emissions of vehicles in use, or set an emissions reduction target for in-use vehicles and give states complete latitude in how to meet the target.

The Clean Air Act requires inspection and maintenance (I/M) programs as one of the conditions for EPA approving state implementation plans in regions classified as at least "serious" for non-attainment of the NAAQS for ozone or carbon monoxide.[56] There were programs in part or all of thirty-three states and Washington, D.C. in 2005.

EPA regulations specify in detail how states must operate their I/M programs.[57] They must inspect light-duty vehicles (i.e., cars, SUVs, minivans, and most pickup trucks) at least biennially at private garages or at centralized facilities established by government, usually through contractors. The level that a

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[54] Andrew P. Morriss, *The Next Generation of Mobile Source Regulation*, 17 N.Y.U. ENVTL. L.J. 325 (2008).

[55] *See* AIR QUALITY MANAGEMENT, *supra* note 20, at 168.

[56] 42 USC §§ 7511a, 7512a (2000).

[57] *See* 57 Fed. Reg. 52950, 52950–53014 (Nov. 5, 1992); U.S. ENVTL. PROT. AGENCY, INSPECTION & MAINTENANCE (I/M) (2007), *available at* http://www.epa.gov/otaq/im.htm.

vehicle's emissions may not exceed, the "cut point", can vary from state to state (and even within states) based on a given region's non-attainment designation (e.g., "serious", "extreme", etc.), state legislative and administrative choices, the pollutant at issue, and the vehicle's vintage.[58] EPA also specifies the amount of emission-reduction credit that the states can claim in their state implementation plans for operating the I/M program.[59] These claimed reductions were large until 2002, when EPA reduced the available credit.

While EPA granted states a great deal of SIP credit on paper, I/M has done little to reduce real-world emissions. A National Research Council study of I/M programs issued in 2001 found that measurements of emissions from cars on the road showed that "the emissions reductions attributable to these programs are from *zero* to about *one-half* of the reductions predicted by the [EPA] models."[60] The National Research Council found this shortfall was due partly to EPA overestimating the potential benefits of the program.[61] Manufacturers have become more successful than they were in the 1970s or 1980s at making cars that stay low emitting without any special intervention on the part of the motorist.[62] For many cars, therefore, I/M adds no benefit.

The shortfall is also due to I/M programs being much less successful in finding and repairing vehicles that do become high emitters than EPA claimed the programs would be. There are a multitude of reasons for this failure, including program avoidance on the part of motorists, corruption by vehicle inspectors and repair shops, and shoddy or incomplete repairs.[63]

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[58] *See* COMMITTEE ON VEHICLE EMISSION INSPECTION AND MAINTENANCE PROGRAMS, BOARD ON ENVIRONMENTAL STUDIES AND TOXICOLOGY, TRANSPORTATION RESEARCH BOARD & NATIONAL RESEARCH COUNCIL, EVALUATING VEHICLE EMISSIONS INSPECTION AND MAINTENANCE PROGRAMS, 72 (2001) [hereinafter EVALUATING VEHICLE EMISSIONS].

[59] Each state determines the amount of credit by running EPA's on-road mobile-source-emissions computer model, known as MOBILE. The latest version is MOBILE6. Emissions credit for I/M is hardwired into the model and mainly depends on inputs such as the level of the cut points, the frequency of inspections, the test type, and the model years of vehicles included in the program.

[60] EVALUATING VEHICLE EMISSIONS, *supra* note 58, at 2 (emphasis added).

[61] *Id.* at 4.

[62] *Id.* at 43.

[63] PETER MCCLINTOCK, PRESENTATION AT THE 15TH ANNUAL MOBILES SOURCES/CLEAN AIR CONFERENCE: IDENTIFYING AND REDUCING PROGRAM

I/M programs are also unpopular. Testing costs billions per year, financed either by fees on drivers or taxpayer subsidies. The time involved is also substantial.

In 2001, EPA amended its regulations to allow states to replace tailpipe testing with a check of the on-board-diagnostic (OBD II) systems that EPA has required auto manufacturers to install in vehicles since the 1996 model year.[64] These systems do not measure emissions directly, but are calibrated so that a "check engine" dashboard light illuminates if the system detects any condition that might result in excessive emissions. OBD II systems are not foolproof, however, and cars prior to 1996, which have the greatest pollution potential, lack such systems.

Although I/M's failures are well documented, EPA regulations discourage states from finding and fixing flaws in their programs. States receive emission credit based on having programs whose features meet EPA specifications, rather than by demonstrating actual emission reductions. As the National Research Council found, "EPA has granted states substantial emissions reduction credits for I/M programs without the need to verify the extent to which the predicted emissions reductions are actually occurring. That situation creates a regulatory disincentive for states to evaluate the actual emissions-reduction benefits from I/M programs."[65] If a state concludes that its program is not working, it would have to revise its SIP to put additional burdens on other pollution sources to make up the difference, or else risk sanctions.

The 2001 National Research Council study has, like many independent scientists, economists, and policy experts, recommended that I/M programs focus on the vehicles most likely to exceed the cut points.[66] The National Research Council

AVOIDANCE IN CENTRALIZED I/M PROGRAMS, (1999); D. H. Stedman et al., *Repair Avoidance and Evaluating Inspection and Maintenance Programs*, 32 ENVTL. SCI. & TECH. 1544, 1544–45 (1998); M. McCloy, *DEQ Director Grilled; Emissions Focus of Bribery Scandal*, ARIZONA REPUBLIC, Sept. 22, 1999, at 1B; Amy Ando et al., *Costs, Emissions Reductions, and Vehicle Repair: Evidence from Arizona*, Resources for the Future, Discussion Paper 99-23-REV, 6–7, Oct. 1999; T. P. Wenzel et al., *Short-Term Emissions Deterioration in the California and Phoenix I/M Programs*, 9 TRANSPORTATION RESEARCH PART D: TRANSPORT AND ENVIRONMENT, 107, 111–13 (2004).

[64] 40 C.F.R. § 86.094–17.

[65] EVALUATING VEHICLE EMISSIONS, *supra* note 58, at 3.

[66] *Id.* at 5.

repeatedly emphasized that a small number of vehicles produce the vast majority of "excess" emissions—that is emissions above the test-failure cut points: "5% of vehicles produc[e] 75% or greater of excess emissions."[67] The National Research Council concluded that testing all the vehicles "is inefficient and costly because of the skewed distribution of emissions across the vehicle fleet; 10–20 must be tested to identify one high-emitting vehicle that is a candidate for repairs."[68]

The time for state I/M programs has likely passed. If these programs must continue, they should focus on those few automobiles that cause the most pollution, rather than put all drivers through an irritating, ineffective, and, for most vehicles, unnecessary procedure.

One way to home in on these "gross emitters"—the highest-polluting automobiles—is to schedule for testing only those vehicle makes and model years whose statistical profile makes them likelier to be high emitters.[69] Another way is to use remote sensing devices. These devices, placed beside a road, employ light beams to measure emissions of passing vehicles, and automated cameras to read their license plates. As the 2004 National Research Council report stated, "remote-sensing technologies . . . are becoming increasingly sophisticated and could provide accurate measurement of in-use vehicle emissions under actual driving conditions."[70]

Another option is to apply I/M to large trucks and other heavy-duty vehicles. EPA has no I/M requirement for these vehicles, even though heavy trucks have larger engines, are used more hours per day, and last longer.[71] Because heavy-duty vehicles make up an increasing fraction of mobile-source emissions,[72] eleven states already have programs to control in-use emissions from heavy-duty vehicles, but EPA gives them no emission-reduction credit for doing so.

The rationale for having an I/M program is much weaker today than a decade or more ago when manufacturers were less

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[67] *Id.* at 44.
[68] *Id.* at 115–16.
[69] *Id.* at 90–91.
[70] AIR QUALITY MANAGEMENT, *supra* note 20, at 149.
[71] *Id.* at 169.
[72] *Id.*

successful at making cars that stayed clean as they age. A recent report on a decade's worth of on-road emissions measurements found that cars in regions with I/M were little cleaner than cars in regions without I/M and that more recently manufactured cars deteriorate far more slowly than previous models.[73] If the federal government is going to continue to require I/M for cars, the states should be free to design their own programs as they see fit. As the 2001 National Research Council study concluded: "[s]tates should be given flexibility to choose a regime that meets their emissions-reduction goals at the lowest cost to the public."[74]

C. *Certain Other Nationally Marketed Goods*

The Clean Air Act now provides for direct federal regulation of VOC emissions from paints and solvents.[75] This regulation applies to both manufacturers and importers. We recommend that this system continue.

III. CONGRESS SHOULD RESTORE TO THE STATES THE CHOICE OF HOW TO DEAL WITH THE REMAINING SOURCES

As noted in the introduction, states responded to public concerns about pollution long before 1970 when the federal government created EPA and put the states under federal control. Although states varied in their responses, their efforts resulted in large reductions in air pollution during the mid-twentieth century. To build upon this success, Congress should free states from federal control in dealing with intrastate pollution. The first section of this part describes the current program under which the federal government controls how states regulate intrastate pollution and that program's shortcomings. The second section recommends that (1) Congress limit the federal role to the regulatory measures specified in parts I–II with an additional proviso to deal with interstate pollution problems that might arise; (2) the federal government provide air quality data and information to the states and the public; and (3) to ease the transition, Congress leave current federal air pollutant emission limits (but not process requirements) in place unless states choose to change them.

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[73] Bishop & Stedman, *supra* note 3 at 1654–56.

[74] EVALUATING VEHICLE EMISSIONS, *supra* note 58, at 5.

[75] *See* 42 U.S.C. §§ 7511b(e), 7671 et seq. (2000).

A. *The Current Program*

The NAAQS-SIP process is the main method for federal direction of states' air pollution regulatory activities. It is severely troubled. One problem is that EPA has been unable to establish a coherent basis for deciding at what level it should set the NAAQS.[76] The problem is essentially political. The statute tells EPA to set the standards without regard either to cost of control or to whether the standard can be attained. In practice, however, political and economic realities have meant that EPA has, under Democrats and Republicans alike, considered other factors beside health impacts of pollution. Because of the statute, EPA has, however, had to do so covertly.[77]

Congress's pretense of protecting health without regard to cost not only misleads the public, but it also makes the Clean Air Act difficult to amend. At the level of the high-sounding principle of protecting health without regard to cost, compromise is impossible. In contrast, where Congress has taken responsibility for setting pollution reduction targets for particular types of sources, compromise is possible. For example, some legislators might believe that emissions from some source category should be reduced a further 35 percent and other legislators might think the right number is 28 percent. It is possible to investigate the merits of both positions and, without losing face, settle on a number. Not only is compromise possible, but Congress can, by actually making a decision, lend to EPA the political legitimacy it needs to move forward with dispatch. Where Congress has taken such responsibility, the Clean Air Act has been most effective in both cutting emissions and minimizing process-focused administrative burdens.

Another difficulty with the NAAQS-SIP process is that EPA and the states are unable to predict accurately whether a SIP will achieve the NAAQS on schedule. Such predictions require inventorying current emissions and then calculating both the emissions resulting from the SIP's control strategies and the ambient air quality resulting from these emissions. The process requires multiple steps, each subject to substantial uncertainty, in some cases of a factor of two or more, as well as frequent

[76] Cary Coglianese & Gary Marchant, *Shifting Sands: The Limits of Science in Setting Risk Standards*, 152 U. PA. L. REV. 1255, 1291 (2004).

[77] *See id.* at 1339–47.

systematic errors.[78] Because the errors can be large and multiplicative, they can lead to grossly under-predicting or over-predicting future pollution levels. In practice, however, the tendency has been for states and EPA to under-predict future pollution levels and thereby falsely claim that SIPs would achieve the NAAQS on time.

The false prediction of attainment has long been recognized and is the result of the Clean Air Act's incentive structure. The Clean Air Act *requires* states to demonstrate future attainment of the ambient standards by given deadlines, or suffer sanctions such as loss of federal highway funding and restrictions on economic development. However, while imposing daunting penalties for failing to *predict* attainment of the NAAQS, the Clean Air Act imposes slight penalties for failing to *deliver* on the predictions, and those penalties are little enforced.[79] States therefore naturally arranged their inventories and modeling so as to predict attainment. For its part, EPA did not want to impose unpopular, draconian sanctions for fear of a political backlash against the agency, and therefore tilted towards approving states' SIPs, however implausible their predictions might be.

A national commission, which included key members of Congress, concluded in 1981 that the states and EPA fake predictions that SIPs will attain the NAAQS.[80] The National Research Council's 2004 study, *Air Quality Management in the United States*, delicately broaches the possibility that the states and EPA cook the books:

> It is possible that the requirement to demonstrate attainment in a SIP inadvertently encourages the regulatory community to be overly optimistic when considering the benefits of specific measures. It is also possible that, in some cases, EPA has allowed state and local agencies to take large emission credits

[78] NRC's 2004 study found that emission inventories have "an uncertainty of about a factor of two or more, although . . . the uncertainty factor is poorly defined." AIR QUALITY MANAGEMENT, *supra* note 20, at 99. As to the calculations, "[l]iterature estimates for *individual* components of an air quality model—emissions, chemistry, transport, vertical exchange, deposition—typically indicate uncertainties of 15–30%, but when the supporting data sets are weak, the uncertainties can be significantly higher." *Id.* at 113 (emphasis added).

[79] AIR QUALITY MANAGEMENT, *supra* note 20, at 125. *See also id.* at 297 n.6.

[80] NATIONAL COMMISSION ON AIR QUALITY, TO BREATHE CLEAN AIR 4, 117 (1981).

> for specific programs to encourage program use and propagation. Finally, it is possible that EPA has allowed some to take overly generous emission credits to put off rancorous policy disputes.[81]

When the early SIPs failed to achieve the NAAQS by the statutory deadlines, Congress extended them, first in 1977 and again in 1990. It gave the longest extensions to the areas with the gravest pollution. In this, Congress implicitly traded off the benefits of cleaner air against the costs of attaining it. Nonetheless, congressional leaders still maintained the fiction that costs may not be considered in setting standards.[82]

The NAAQS-SIP process is but one example of the Clean Air Act's focus on process, rather than on results. The Clean Air Act as a whole has grown from eight ordinary book-length pages of 420 words in 1965 to 85 pages in 1970, 238 pages in 1977, and 450 pages in 1990. The regulations issued under it run to 13,060 pages.[83] Then there are tens of thousands of pages of SIPs having the force of law. No one knows the number of pages of "guidance documents" explaining what the regulations mean. To this we must add millions more pages of permits, rate-of-progress reports, conformity findings, and other implementation documents. The Clean Air Act creates enough paper to fill many warehouses. Faced with administering such a behemoth, the agency has missed most of the statutory deadlines for the Clean Air Act as a whole.

This focus on process hurts the public in many ways, as illustrated by the waste and ineffectiveness of the I/M program. In general, the process requirements keep sources from using more efficient ways to reduce pollution and focus government officials on wasteful and ineffective paperwork, diverting attention and resources from activities that would actually clean the air, as the National Research Council found.[84]

Moreover, the system is too complicated for Congress to give coherent instructions to state and federal regulators. For example, the 1990 version of the statute set specific deadlines for achieving the then-existing NAAQS and also required EPA to revise those

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[81] AIR QUALITY MANAGEMENT, *supra* note 20, at 129 box 3-7.

[82] *See* ENVTL. POLICY WEEKLY BULLETIN, at A3 (Jan. 29, 1990) (remarks of George Mitchell).

[83] *See* 40 C.F.R. §§ 50–99 (2008) (the number of total pages include the appendices of the respective sections).

[84] *See, e.g.*, AIR QUALITY MANAGEMENT, *supra* note 20, at 128.

NAAQS when there is new information, but failed to address how to determine the deadline for achieving a NAAQS once it is revised. Settling that fundamental question, which in hindsight had to arise, took years of litigation up to the Supreme Court. A scholar who had previously worked on the legislation as a Democratic staffer in the House of Representatives commented: "Given the detail of the statute, it is hard to believe that anyone in Congress made a conscious decision to leave the issue unaddressed. Rather, the intricacy of the statute simply overwhelmed the legislative process."[85]

Environmental advocates have been leery of leaving states to control intrastate pollution without being policed by the federal government. Left to their own devices, states will vary in how they strike the balance between reducing emissions and other social concerns. Some may well accept more emissions than others would prefer. But freeing states from federal control on intrastate air pollution also brings advantages in reducing risk and advancing other social concerns. If we believed that people would end up worse off, we would balk at extending the idea of state control of intrastate pollution to its logical conclusion. We favor state control of intrastate pollution because of the lessons of experience.

Some argue that states, left to their own devices, would "race to the bottom." Not only is this idea based upon questionable logic,[86] but it is contradicted by experience showing that, where federal control has been absent, states were more likely to race to the top.[87] There are many examples of state and local governments racing ahead of the federal government on air pollution, and, more recently, in regulating greenhouse gases. Many states and cities were reducing air pollution for decades before the federal

[85] Craig N. Oren, *Run Over by American Trucking Part II: Can EPA Implement Revised Air Quality Standards*, 30 ENVTL. LAW REPORTER 10034, 10048 (2000).

[86] Richard L. Revesz, *Rehabilitating Interstate Competition: Rethinking the Race to the Bottom Rationale for Federal Environmental Regulation*, 67 N.Y.U. L. REV. 1210, 1244 (1992).

[87] Wallace E. Oates, *A Reconsideration of Environmental Federalism*, *in* RECENT ADVANCES IN ENVIRONMENTAL ECONOMICS 1, 12–15, 17 (John A. List & Aart de Zeeuw, eds., 2002); Jonathan Adler, *The Ducks Stop Here? The Environmental Challenge to Federalism*, 9 SUP. CT. ECON. REV. 205, 228–229 (2001).

government stepped in in 1970.[88] With the nation wealthier now than in the 1960s, with concern about the environment rising, even as ambient pollution levels fall, there is reason to be confident that states will continue to address their residual air pollution concerns, with or without federal control or oversight.

Regardless of these concerns, the federal government would, under our recommendations, control the bulk of emissions of criteria pollutants. In addition, industries have already borne the capital cost of pollution equipment, and those that might want to roll back standards would bear the burden of getting the standards loosened. Retrenchment is possible through lax enforcement, but states bring the bulk of enforcement actions under the present statute and, through timely emission data provided by the federal government, enforcement policy would be made more transparent and thus more accountable.

The federal government would also regulate the lion's share of HAP emissions and any associated risks. But this leaves the question of the scope of risks left to state control. According to EPA's 1996 assessment, HAPs (excluding diesel) imposed a national-average lifetime risk of 55 cases of cancer per 1,000,000 Americans.[89] According to the American Cancer Society, about 41.5 percent of Americans, or 415,000 out of one million people, will develop cancer at some time during their lifetime. If HAPs account for 55 of this 415,000, then hazardous air pollutants (including the federally regulated ones) account for 0.013 percent,[90] or about one out of every 7,500 cases of cancer.

We used EPA's assessment for 1996, although newer estimates are available, because by that year, EPA had done little to regulate emissions of HAPs from stationary sources, even though the agency had been under statutory mandate to regulate them since 1970.[91] Meanwhile, states were taking action. For

[88] Goklany, *supra* note 9, at 30; *see also* JOEL A. TARR, THE SEARCH FOR THE ULTIMATE SINK ch. 8 (University of Akron Press, 1996); Hugh W. Ellsaeser, *Trends in Air Pollution in the United States*, *in* THE STATE OF HUMANITY 491, 493, 495 (Julian L. Simon ed., 1995); J. H. Ludwig et al., *Trends in Urban Air Quality*, EO551, 468–75 (1970).

[89] U.S. ENVIRONMENTAL PROTECTION AGENCY, TECHNOLOGY TRANSFER NETWORK: 1999 NATIONAL-SCALE AIR TOXICS ASSESSMENT (2008), *available at* http://www.epa.gov/ttn/atw/nata1999/natafinalfact.html.

[90] 55/415,000 = 0.013 percent.

[91] Section 112 of the 1970 Clean Air Act mandated regulation of HAPs, but the agency accomplished little under the 1970 legislation. *See* Victor B. Flatt,

example, in response to popular sentiment, Louisiana cut HAP emissions by one-third from 1988 to 1997.[92] Since 1996, EPA has promulgated dozens of regulations to reduce HAP emissions and accordingly its HAP cancer risk estimates dropped between 1996 and 1999 from fifty-five down to forty-one per million and are lower still today.[93]

The discussion above is based on national averages. Some counties, of course, have higher-than-average HAP levels, and therefore, according to EPA, higher HAP-related cancer risks. According to EPA's 1996 data, the riskiest county was New York County—that is, Manhattan—where this symposium is being held and two of the authors live with their families. EPA estimated that in 1999 HAPs (excluding diesel) imposed an average risk of 136 cancers per million people here, or more than three times the national average of forty-one per million. The term "Cancer Alley" is applied to the heavily industrialized area along the Mississippi river between Baton Rouge and New Orleans. Of the eleven parishes in Louisiana in "Cancer Alley," nine were at or below the national average of HAP cancer risk and one was above.[94]

Gasping for Breath: The Administrative Flaws of the Federal Hazardous Air Pollutant Program (University of Houston Public Law and Legal Theory Series, Working Paper 2006-W-01, 6, 2006). The 1990 Clean Air Act amended section 112 to light a fire under the agency, but 4 four of the 108 Maximum Achievable Control Technology rules that the agency issued since 1990 had an effective date for existing sources before the end of 1996. The 1996 National-Scale Air Toxics Assessment (NATA) estimates are based upon the 33 "Urban HAPS," although diesel particulate matter was not included in EPA's cancer risk assessments.

[92] *Id.* at 75; *see also id.* at 31 ("Louisiana's current toxic air pollutant control program covers over 200 pollutants, and tracks toxic air emissions from over 250 industrial facilities.").

[93] U.S. ENVTL. PROT. AGENCY, 1999 ASSESSMENT RESULTS, http://www.epa.gov/ttn/atw/nata1999/nsata99.html (last visited Sept. 30, 2008).

[94] The area along the Mississippi River between Baton Rouge and New Orleans has been referred to as the "industrial corridor," the "chemical corridor," and "cancer alley." It is apparent from reviewing the literature regarding this area that there is some fluidity as to which parishes are included in the industrial corridor. For example, seven parishes were included in the study of cancer incidence in the industrial corridor conducted by Chen et al., infra note 95, while a GIS study carried by John K. Wildgen included 10 parishes. *See* JOHN K. WILDGEN, ENVIRONMENTAL JUSTICE IN LOUISIANA'S INDUSTRIAL CORRIDOR (1998), *available at* http://gis.esri.com/library/userconf/proc98/proceed/TO200/PAP158/P158.HTM. We expanded our analysis on cancer risks to include all 11 parishes directly bordering the Mississippi River between Baton Rouge and New Orleans. It should be noted that the two parishes in Louisiana with the highest risk according to the 1996 NATA report were Terrebonne and Vermillon

Actually, EPA's estimates understate the difference between New York City and "Cancer Alley" because EPA's estimates do not include diesel particulates, which are highest in dense urban areas, such as Manhattan. It should be noted, moreover, that age-adjusted cancer rates in "Cancer Alley" are generally similar to or lower than the average for the nation and for Louisiana.[95]

The preceding paragraphs and a like one in part I.B.5, are the only two points in this essay where we have cited data on the health effects of pollution. In general, we have based our recommendations on how we think it makes sense to structure environmental law and regulation, rather than on contentions about the risk associated with various pollution levels. We have brought up the data on cancer risk to explain why we think that our proposals would not cause dire risks even if states do not live up to our expectations. We do not, however, want to leave the topic without noting in the margins that there is a substantial body of scientific evidence suggesting that real risk of developing cancer due to air pollution is much lower than the already-low risks suggested by EPA's estimates.[96] Should scientific understandings change, not only EPA but the National Cancer Institute and other federal health entities would be in a position to point out unresolved problems.

It has been argued that the federal government should continue to direct the states in order to provide a floor beneath which air quality cannot go. Yet, the federal floor creates perverse effects through over-centralization. The perils of over

parishes, with an average risk of 129 and 161 cancers per million persons, respectively. Terrebonne Parish is directly south of the industrial corridor, and Vermillon Parish is southwest of the industrial corridor.

[95] Vivien W. Chen, et al., *Cancer Incidence in the Industrial Corridor: An Update*, 150 JOURNAL OF THE LOUISIANA STATE MEDICAL SOCIETY 158 (1998).

[96] Much of this science is collected in STEPHEN BREYER, BREAKING THE VICIOUS CIRCLE: TOWARD EFFECTIVE RISK REGULATION (Harvard University Press 1993) [hereinafter BREAKING THE VICIOUS CIRCLE]. *See also* Bruce Ames & Lois Swirsky Gold, *Paracelsus to Parascience: The Environmental Cancer Distraction*, 447 MUTATION RESEARCH 3 (2000), *available at* http://potency.berkeley.edu/pdfs/Paracelsus.pdf (demonstrating that doses from oral exposure, though higher than doses from inhalation, nonetheless are much lower than the doses needed to cause cancer); Bruce N. Ames & Lois Swirsky Gold, *Misconceptions on Pollution and the Causes of Cancer*, 29 ANGEWANDTE CHEMIE 29 1197, 1200–01 (1990). A poll of independent cancer researchers suggests that most tend to agree with Ames and Gold. S. ROBERT LICHTER & STANLEY ROTHMAN, ENVIRONMENTAL CANCER—A POLITICAL DISEASE? 69, 88, 122, 162 (Yale University Press, 1999).

centralization are illustrated by the I/M program and the dysfunctional NAAQS-SIP process. The air pollution control system, already top-heavy and procedure-bound, will become even more so if it takes on climate change. To perform effectively the jobs that only the federal government can do, it needs to let go of *intra*state pollution

Even now, federal supervision over sources of chiefly local concern prevents states and localities from addressing them in light of new information or changed circumstances. State and local governments inclined to take local actions on air pollution have reason to wait until they know what EPA will ultimately require, lest they impose requirements that are incompatible with or overridden by EPA's commands. This can mean waiting years for EPA to adopt standards and regulations and for inevitable judicial review processes to run their course. When new information suggests that a small source can be adequately controlled in a less burdensome way than required by the SIP or other federal plans, changing it requires federal as well as state approval, and the entire process typically takes many years.[97] Moreover, the abundant activity of Congress and EPA in dictating the terms of the state response to intrastate air pollution diverts attention from the federal failures to deal adequately with interstate and international pollution.

B. *Recommendations*

1. *Congress Should Leave Intrastate Pollution to the States*

States have not always been good to their downwind neighbors. This suggests a role for the federal government in policing interstate pollution. States tend to fail to address in-state emission sources that have their main impact on *other* states. This failure is no reason to put all sources under federal control, even though all sources, even the home heating furnace, can in principle account for at least some pollution that crosses state lines. Most pollution sources predominantly impact pollution levels within the state where the emissions occur. That makes state officials

[97] William F. Pederson, *Why The Clean Air Act Works Badly*, 129 U. PA L. REV. 1059, 1078–79 (1981). NRC also found that state "[a]gencies with already strong permit programs thought that the Title V regulations increased the complexity of the permitting process without improving the overall results." *See* AIR QUALITY MANAGEMENT, *supra* note 20, at 191.

accountable for most of the impact, and that should be enough in a world where local, state, and federal actions routinely affect those voting elsewhere.

Our proposals in parts I and II would put under federal control sources that account for the lion's share of interstate pollution. As a precaution against states putting looser controls on sources whose emissions mainly affect air quality in *other* states, Congress should enact a golden rule for trans-boundary pollution.[98] The rule would allow a state to get relief from a federal court if an upwind state imposed less stringent emission limits on sources whose major impact fell on the downwind states as compared to sources whose major impact fell on the source state. The application of such a rule would call for judgment, primarily in deciding which source categories within the source state are comparable and gauging whether there are justifiable reasons for differences of stringency unrelated to disregard of the downwind state. Nonetheless, such a rule is a good deal more manageable than the present provision of the Clean Air Act, which has been unworkable in source by source applications or the law of nuisance.[99] Moreover, the allocation of sources between federal and state control that we propose should not be written in stone. Congress should revise it as understandings of air pollution change, as new concerns develop, and as old ones fade.

Otherwise, Congress should leave states free to deal with air pollution as they choose except for those pollution sources designated for federal regulation. In particular, Congress should eliminate the NAAQS-SIP process and its manifestations dealing with "non-attainment" and "prevention of significant deterioration" as well as the Title V permit program. If a state wants to go beyond the federal requirements, it is free to place

[98] We take the concept from Thomas W. Merrill, *Golden Rules for Transboundary Pollution*, 46 DUKE L.J. 931 (1997), but would apply it differently. His approach has been criticized as ambiguous. Craig Oren, *Clean Air and Interstate Transport: Seeing the Big Picture*, 10 N.Y.U. ENVTL. L.J. 196, 204 (2002) (this criticism focused on a tougher context where states were the primary regulators of large sources such as power plants and the relevant question was apportioning responsibility between states for meeting *ambient* air targets. In our proposal, the federal government would regulate the largest sources and the relevant question would be whether a state imposes less stringent *emission* standards on sources whose major impact falls on other states.

[99] *See* 42 U.S.C. § 7426 (2000); RESTATEMENT (SECOND) OF TORTS: NUISANCE § 821A (1979), PROSSER & KEETON, THE LAW OF TORTS § 86 (1984).

stricter controls on in-state sources, including federally-regulated stationary sources.

A corollary would be to end "transportation conformity" under which state transportation officials must show that federally funded transportation projects are consistent with the emissions "budget" in the state SIP. There are many reasons, including environmental ones, to be concerned about traffic and transportation infrastructure. However, experience has proven that technology, in the form of inherently cleaner vehicles, is eliminating transportation-related air pollutants rapidly and will continue to do so.[100] It costs tens to hundreds of times more to avoid a ton of emissions through transportation infrastructure decisions than through direct emission limits on vehicles.[101] The air quality tail of transportation projects should no longer wag the mobility dog.

A second corollary would be to end the Clean Air Act's Visibility/Regional Haze requirements. The current Clean Air Act system for regulating visibility includes a planning process that mirrors the NAAQS-SIP process. However, under our proposal, visibility naturally falls under our direct federal approach to interstate pollution. Visibility is quintessentially an interstate pollution issue, and the vast majority of visibility-impairing emissions come from sources that would be under federal regulation in our plan.

State and local governments should also retain their traditional land use (i.e., zoning) authority with regard to federally regulated sources. So, for example, states would be able to address pollution hot spots that might occur due to concentrations of emissions sources—e.g., freeways, ports, or agglomerations of industrial sources.[102] And, as already indicated, they could impose

[100] *See, e.g.*, Bishop & Stedman, *supra* note 3, at 1655.

[101] For example, the Federal Transit Administration's annual "new starts" reports for federally funded rail transit projects include estimates of capital and operating costs and VOC and NOx emissions (which help form ozone and particulate matter) avoided from reduced automobile trips. Based on these numbers, the emission reductions cost anywhere from hundreds of thousands to millions of dollars per ton of pollution avoided. Regulators normally do not consider ozone control measures cost effective unless they cost less than about $10,000 per ton. FEDERAL TRANSIT ADMINISTRATION, ANNUAL REPORT ON NEW STARTS (various years), *available at* http://www.fta.dot.gov/printer_friendly/publications_2618.html.

[102] Indeed, the California Air Resources Board recently adopted such

their own tougher emission limits on federally-regulated stationary sources.

We recommend that state legislatures structure their regulations along the same lines we suggest for federal regulation, but that should be a matter of state prerogative. In particular, states should provide each source with a comprehensive list of emission limits to which it is subject, rather than dribbling them out pollutant by pollutant and program by program. This should be practicable if states are freed from the Clean Air Act process and planning bureaucracy.

States should use cap-and-trade for those source categories for which it is possible to measure emissions accurately and with appropriate safeguards against hot spots as discussed above. States should allow state-regulated sources to use federal pollution credits bought from federally-regulated sources in the same region to satisfy state pollution limits.[103] And just as the federal government should leave intrastate pollution sources to states, states should in turn consider leaving regulation of highly localized pollution sources to municipalities.

2. *The Federal Government Should Provide Information to States and the Public*

There may be economies of scale in having the federal government assemble and provide to the public and states information on air pollution levels, trends, health and welfare effects, and control techniques. In addition, federally-provided information could help overcome information asymmetries that might exist at the state and local level.

Specifically, EPA should collect and disseminate the following information:

- the health and environmental effects of each pollutant at

requirements for ports throughout the state, including those of Los Angeles and Long Beach. *See* CAL. CODE REGS. tit. 13, § 2299.1 (2008).

[103] Lesley K. McAllister, *Beyond Playing "Banker": The Role Of The Regulatory Agency In Emissions Trading*, 59 ADMIN. L. REV. 269, 305, 313 (2007) (finding that the RECLAIM cap-and-trade program did not work well). The author concludes that cap-and-trade will not work well unless state regulators coach the smaller sources. Others might deduce from the same data that the state regulators botched the job by sending market signals erratically and failing to include an automatic fine mechanism. In either event, the design of cap-and-trade programs requires careful attention.

various concentrations in the ambient air;

- the technologies available to control pollution from various categories of sources;
- the amount of emissions from individual sources; and
- ambient air quality at various locations around the country.

While EPA should provide health and environmental impact information, its word should not be gospel. As many commentators, including Justice Stephen Breyer, have noted, risk regulators tend to exaggerate the risks they regulate.[104] Also, regulated interests try to subvert the agency science process to their own ends. Various safeguards, such as EPA's Science Advisory Board, are far from full-proof checks. In short, it is impossible to guarantee disinterested agency science. The best anyone can do is to make the science process as open, competitive, and disinterested as possible. It is with that objective in mind that the essay by Angus Macbeth and Gary Marchant suggests reforms. Another possibility is for the sort of independent information institute discussed in this Project's proposal to comment from time to time on the overall objectivity of EPA's risk analyses. Beyond that, elected officials should seek independent evaluations of EPA's scientific assessments from a range of outside experts. At the end of the day, unless EPA acknowledges uncertainties and minimizes bias, its information will have little credibility. With EPA no longer directing the states, its only leverage over the states would come from providing credible information.

EPA would have a particularly important role in collecting emissions and ambient air quality data. We have already pointed out several problems with EPA's data. Many of its emissions inventories are inaccurate, while variations in terminology and definitions and poor quality assurance impede apples-to-apples comparisons between data from different states and between EPA's various emission databases. The National Research Council's 2004 report concluded that we have "not developed a comprehensive and quantitative program to track emissions and emissions trends."[105] Part of the problem is that EPA is so overwhelmed by its impossibly large regulatory agenda that it must rely unduly on state data that it too often takes at face value. One of the advantages of reducing EPA's regulatory role is that it

[104] *See* BREAKING THE VICIOUS CIRCLE, *supra* note 96, at 46–47.

[105] AIR QUALITY MANAGEMENT, *supra* note 20, at 266.

could place more emphasis on producing better data.

Credible EPA data would allow people to compare states based on how well they reduce actual emissions. This would make the state regulatory process more transparent and create incentives for state and local officials to produce results. Governors and mayors do not want their jurisdictions to rank poorly on matters of concern to their constituents, such as air pollutant emissions or levels.

3. *Congress Should Leave Federal Emission Limits in Place but Give States the Option of Changing Them*

To ease the transition to the system we propose, Congress should end all Clean Air Act administrative and process requirements but leave in place all current substantive limits on emissions. States would then be allowed to either let the federal emission limits continue or to adopt their own requirements. That would mean, for example, that the emission limits in EPA's Phase I regulations of HAPs would remain in force unless a state affirmatively decided to change them.

CONCLUSION

The plan we propose is a path out of the procedural morass that the Clean Air Act imposes. Our plan builds on the successes, refocuses air pollution regulation on results, assigns to the federal government those issues that it can tackle most efficiently, and leaves the states to deal with local concerns.